

REMARKS

Upon entry of the Amendment, Claims 1 and 3-31 will be pending in the application. The subject matter of Claim 2 has been incorporated into Claim 1, and Claim 2 has been canceled. Therefore, no new matter has been added.

I. Response to Claim Rejection - 35 U.S.C. § 102

Claims 1-3 have been rejected under 35 U.S.C. § 102(b), as allegedly being anticipated by U.S. Patent No. 5,930,086 to Chaug *et al.* ("Chaug '086").

Claim 1 presently recites that the film has a Vickers hardness equal to or greater than 2,000 kg/mm².

In contrast, Chaug '086 discloses that the diamond-like carbon film thereof has a high sp³/sp² ratio, a low hydrogen content (less than 30%), high hardness and better thermal conductivity. *See*, col. 4, lines 10-12.

Chaug '086 fails to disclose or suggest that the diamond-like carbon film thereof has a Vickers hardness equal to or greater than 2,000 kg/mm². Further, the diamond-like carbon film of Chaug '086 would not necessarily (i.e., inherently) have a Vickers hardness equal to or greater than 2,000 kg/mm². A person of ordinary skill in the art would have appreciated that conventional diamond-like carbon films may have Vickers hardnesses as low as 1,000 kg/mm². A diamond-like carbon film does not always exhibit a Vickers hardness equal to or greater than 2000kg/mm². Therefore, it cannot be concluded that the diamond-like carbon film described in Chaug has the same Vickers hardness as that defined in the present invention.

II. Response to Claim Rejections - 35 U.S.C. § 103

The outstanding Office Action contains six (6) rejections under 35 U.S.C. § 103, as follows:

Claim 2 has been rejected under 35 U.S.C. § 103, as allegedly being unpatentable over Chaug '086;

Claims 3, 11-18 and 25-31 have been rejected under 35 U.S.C. § 103, as allegedly being unpatentable over Chaug '086 in view of U.S. Patent No. 5,609,948 to David et al. ("David '948");

Claims 4-7 and 10-31 have been rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Chaug '086 in view of David '948;

Claims 8 and 9 have been rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Chaug '086 in view of David '948, further in view of U.S. Patent No. 5,764,453 to Potsama ("Potsama '453");

Claims 10 and 23 have been rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Chaug '086 in view of David '948, in further view of U.S. Publication No. 2003/0214745 to Lau ("Lau '745"), even further in view of U.S. Patent No. 6,144,534 to Xue et al. ("Xue '534"); and

Claim 24 has been rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Chaug '086 in view of David '948, in further view of U.S. Publication No. 2003/020294 to Teranuma ("Teranuma '294").

Applicants respectfully traverse these rejections.

As described above, Chaug '086 discloses that the diamond-like carbon film thereof has a high sp³/sp² ratio, a lower hydrogen content (less than 30%), high hardness and better thermal conductivity. *See*, col. 4, lines 10-12. Chaug '086 also discloses that the hardness of the diamond-like carbon film prevents it from replacing the aluminum oxide material of the

insulating layer. *See*, col. 4, lines 29-46. Chaug '086 teaches that the hardness of the diamond-like carbon film provides greater wear for the MR layer (16). *See*, col. 4, lines 29-46. Accordingly, Chaug '086 teaches that the thermally conductive layer (24) of diamond-like carbon does not underlay the MR layer (16').

Applicants respectfully submit that Chaug '086 fails to motivate a person of ordinary skill in the art to provide a Vickers hardness equal to or greater than 2000 kg/mm².

Chaug '086 fails to teach that the hardness of the diamond-like carbon is a result-effective variable. A person of ordinary skill in the art must have recognized that a variable is a result effective variable, before being motivated to optimize the variable. *See*, MPEP § 2144.05 (II)(B). In the present case, Chaug '086 fails to teach the purpose behind the high hardness of the diamond-like carbon film thereof. The characterization of the diamond-like carbon film as having high hardness fails to teach or suggest that it provides for certain advantageous results for the recording head element disclosed in Chaug '086.

Further, Chaug '086 fails to provide the motivation to optimize the diamond-like carbon film toward a Vickers hardness of equal to or greater than 2,000 kg/mm². Chaug '086 teaches against a harder diamond-like carbon film. Chaug '086 discloses a structure accommodating for the hardness of the diamond-like carbon film thereof. Chaug '086 teaches that it moved the location of the MR layer (16') to accommodate for the hardness of the diamond-like carbon film thereof. Such teachings direct a person of ordinary skill in the art to provide for a softer diamond-like carbon film, so that it can provide for a structure that would not have to accommodate for the hardness of the diamond-like carbon film.

David '948 fails to make up for this deficiency in Chaug '086. David '948 teaches that the diamond-like carbon insulates electromagnetic circuitry 62 from substrate 52. *See*, col. 3, lines 25-35. In this regard, a Vickers hardness equal to or greater than $2,000 \text{ kg/mm}^2$ is not needed for the purpose of insulating the electromagnetic circuitry 62 from substrate 52. A person of ordinary skill in the art would not have been motivated to modify the diamond-like carbon film disclosed in Chaug '086 to a Vickers hardness equal to or greater than $2,000 \text{ kg/mm}^2$ based on the teachings of David. Since the diamond-like carbon film in David is provided for the purpose of insulation, it is not necessary for the diamond-like carbon film described in David to have a relatively high hardness, such as a Vickers hardness equal to or greater than 2000 kg/mm^2 .

Potsama '453, Lau '745, Xue '534, and Teranuma '294 also fail to make up for this deficiency in Chaug '086. Potsama '453, Lau '745, Xue '534, and Teranuma '294 are relied upon for reasons unrelated to a Vickers harness equal to or greater than $2,000 \text{ kg/mm}^2$. In this regard, Potsama '453, Lau '745, Xue '534, and Teranuma '294 fail to teach or suggest a Vickers harness equal to or greater than $2,000 \text{ kg/mm}^2$.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
Application No.: 10/791,538

Docket No: Q79638

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

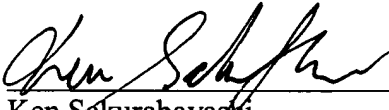
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